NI 6722/6723 Specifications

このドキュメントの日本語版については、ni.com/manuals を参照してください。
(For a Japanese language version, go to ni.com/manuals.)

This document lists the specifications for the NI 6722/6723 analog output devices. The following specifications are typical at 25 °C unless otherwise noted.

Note With NI-DAQmx, National Instruments has revised its terminal names so they are easier to understand and more consistent among NI hardware and software products. The revised terminal names used in this document are usually similar to the names they replace. For a complete list of Traditional NI-DAQ terminal names and their NI-DAQmx equivalents, refer to the *Terminal Name Equivalents* section of Chapter 2, *I/O Connector*, of the *Analog Output Series User Manual*.

Analog Output

Output Characteristics

Number of channels

NI 6722 ..... 8 voltage outputs

NI 6723 ..... 32 voltage outputs

Resolution ..... 13 bits, 1 in 8,192

Max update rate

Number of Channels	Max Update Rate	
	Using Local FIFO (kS/s)*	Using Host PC Memory (kS/s)†
1	800	800
2	714	714
8	476	182
16	333	90.9
24	253	60
32	204	45

* These numbers apply to continuous waveform generation, which allows for the fastest waveform generation because it does not use the PCI bus. The max update rate in FIFO mode does not change regardless of the number of devices in the system. The NI 6722/6723 does not take any time to reset the FIFO to the beginning when cycling through it.

† These results were measured using a PCI-6722/6723 device with a 550 MHz Pentium III machine. These numbers may change when using more devices or when other CPU or bus activity occurs.

Type of DAC ..... Double-buffered, voltage

FIFO buffer size ..... 2,047 samples

DMA channels 3

Data transfers ..... DMA, interrupts, programmed I/O

DMA modes ..... Scatter-gather

Accuracy Information

Nominal Range at Full Scale (V)	Absolute Accuracy					
	% of Reading			Offset (mV)	Temp Drift (%/°C)	Absolute Accuracy at Full Scale (mV)
	24 Hours	90 Days	1 Year			
±10	0.0335%	0.0355%	0.0377%	±7.010	0.0005%	10.78
Absolute accuracy = (% of Reading × Voltage) + Offset + (Temp Drift × Voltage) **Note**: Temp drift applies only if ambient is greater than ±10 °C of previous external calibration.						

Transfer Characteristics

Relative accuracy (INL) ..... ±2.0 LSB max

DNL ..... ±0.9 LSB max

Monotonicity ..... 13 bits

Voltage Output

Range ..... ±10 V

Output coupling ..... DC

Output impedance ..... 0.1 Ω max

Current drive ..... ±5 mA max

Output stability ..... Any passive load

Protection ..... Short-circuit to ground

Power-on state ..... 0 V (±200 mV)

External Reference Input

Range ..... ±11 V

Overvoltage protection ..... ±27 V powered on, ±12 V powered off

Input impedance ..... 10 kΩ

Dynamic Characteristics

Slew rate ..... 0.7 V/µs

Noise ..... 1.0 mV_{rms}, DC to 1 MHz

Channel crosstalk ..... –65 dB with SH68-C68-S cable (generating a 10 V, 100 point sinusoidal at 100 kHz on the reference channel)

Settling time ..... 45 µs typ, 55 µs max to ±0.5 LSB

Glitch energy (at mid-scale transition)

- Magnitude ..... 400 mV
- Duration ..... 2 µs

Channel-to-channel update glitch

- Magnitude ..... 100 mV
- Duration ..... 1.2 µs

Note Channel-to-channel update glitch is the energy glitch that occurs on all channels as the result of a channel update. For example, if you update the value of Channel 7, all other channels will experience this glitch regardless of whether their output voltages change.

Stability

Calibration

- Recommended warm-up time .... 15 min
- Calibration interval ..... 1 yr

Onboard calibration reference

- Level ..... 5.000 V (±2.5 mV) (actual value stored in EEPROM)
- Temperature coefficient ..... ±5.0 ppm/°C max
- Long-term stability ..... ±15 ppm/$\sqrt{1{,}000\ h}$

Digital I/O

Number of channels ..... 8 input/output

Compatibility ..... TTL/CMOS

Digital logic levels

Level	Min	Max
Input low voltage	0 V	0.8 V
Input high voltage	2.0 V	5.0 V
Input low current (V_{in} = 0 V)	—	–320 µA
Input high current (V_{in} = 5 V)	—	10 µA
Output low voltage (I_{OL} = 24 mA)	—	0.4 V
Output high voltage (I_{OH} = –13 mA)	4.35 V	—

Power-on state ..... Input (high-impedance)

Data transfers ..... Programmed I/O

Timing I/O

Number of channels ..... 2 up/down counter/timers, 1 frequency scaler

Resolution

- Counter/timers ..... 24 bits
- Frequency scaler ..... 4 bits

Compatibility ..... 5 V TTL/CMOS

Base clocks available

- Counter/timers ..... 20 MHz, 100 kHz
- Frequency scaler ..... 10 MHz, 100 kHz

Base clock accuracy ..... ±0.01%

Max external source frequency

- Frequency scaler ..... 20 MHz

External source selections ..... PFI <0..9>, RTSI <0..6>

External gate selections ..... PFI <0..9>, RTSI <0..6>

Min source pulse duration ..... 10 ns, edge-detect mode

Min gate pulse duration ..... 10 ns, edge-detect mode

Data transfers

- Up/down counter/timers ..... DMA (scatter-gather), interrupts, programmed I/O
- Frequency scaler ..... Programmed I/O

DMA

- Channels ..... 1 (scatter-gather)
- Data source/destination ..... Analog output, counter/timer 0, counter/timer 1

Triggers

Digital Trigger

Purpose

- Analog output ..... Start trigger, gate, clock
- Counter/timers ..... Source, gate

Source ..... PFI <0..9>

Compatibility ..... 5 V TTL

Response ..... Rising or falling edge

Pulse width ..... 10 ns min

RTSI Bus (PCI Only)

Trigger lines <0..6> 7

RTSI clock 1

PXI Trigger Bus (PXI Only)

Trigger lines <0..5> 6

Star trigger 1

Clock 1

Bus Interface

NI PCI-6722/6723 ..... 3.3 V or 5 V PCI master, slave

NI PXI-6722/6723 ..... PXI/CompactPCI master, slave

Power Requirement

+3.3 VDC (±5%) ..... 300 mA

+5 VDC (±5%) ..... 1.5 A typ, 3 A max (not including power sourced from +5 V pin on I/O connector)

Power available at I/O connector ..... +4.65 to +5.25 VDC at 1 A

Physical

Dimensions (not including connectors)

- NI PCI-6722/6723 ..... 17.4 × 9.8 cm (6.85 × 3.85 in.)
- NI PXI-6722/6723 ..... 16 × 10 cm (6.3 × 3.9 in.)

I/O connector

- NI 6722 ..... 1 68-pin VHDCI
- NI 6723 ..... 2 68-pin VHDCI

Maximum Working Voltage

Maximum working voltage refers to the signal voltage plus the common-mode voltage.

Channel-to-earth ..... ±11 V, Installation Category I

Channel-to-channel ..... ±22 V, Installation Category I

Environmental

The NI 6722/6723 is intended for indoor use only.

Operating temperature.....0 to 50 °C

Storage temperature.....–20 to 70 °C

Humidity.....5 to 90% RH, noncondensing

Maximum altitude .....2,000 meters

Pollution Degree.....2

Note Clean the device with a soft, non-metallic brush. Make sure that the device is completely dry and free from contaminants before returning it to service.

Safety

This product is designed to meet the requirements of the following standards of safety for electrical equipment for measurement, control, and laboratory use:

- IEC 61010-1, EN 61010-1
- UL 61010-1, CSA 61010-1

Note For UL and other safety certifications, refer to the product label, or visit `ni.com/certification`, search by model number or product line, and click the appropriate link in the Certification column.

Electromagnetic Compatibility

This product is designed to meet the requirements of the following standards of EMC for electrical equipment for measurement, control, and laboratory use:

- EN 61326 EMC requirements; Minimum Immunity
- EN 55011 Emissions; Group 1, Class A
- CE, C-Tick, ICES, and FCC Part 15 Emissions; Class A

Note For EMC compliance, operate this device with shielded cabling.

CE Compliance

This product meets the essential requirements of applicable European Directives, as amended for CE marking, as follows:

- 73/23/EEC; Low-Voltage Directive (safety)
- 89/336/EEC; Electromagnetic Compatibility Directive (EMC)

Note Refer to the Declaration of Conformity (DoC) for this product for any additional regulatory compliance information. To obtain the DoC for this product, visit `ni.com/certification`, search by model number or product line, and click the appropriate link in the Certification column.

Waste Electrical and Electronic Equipment (WEEE)

EU Customers At the end of their life cycle, all products *must* be sent to a WEEE recycling center. For more information about WEEE recycling centers and National Instruments WEEE initiatives, visit `ni.com/environment/weee.htm`.

Device Pinouts

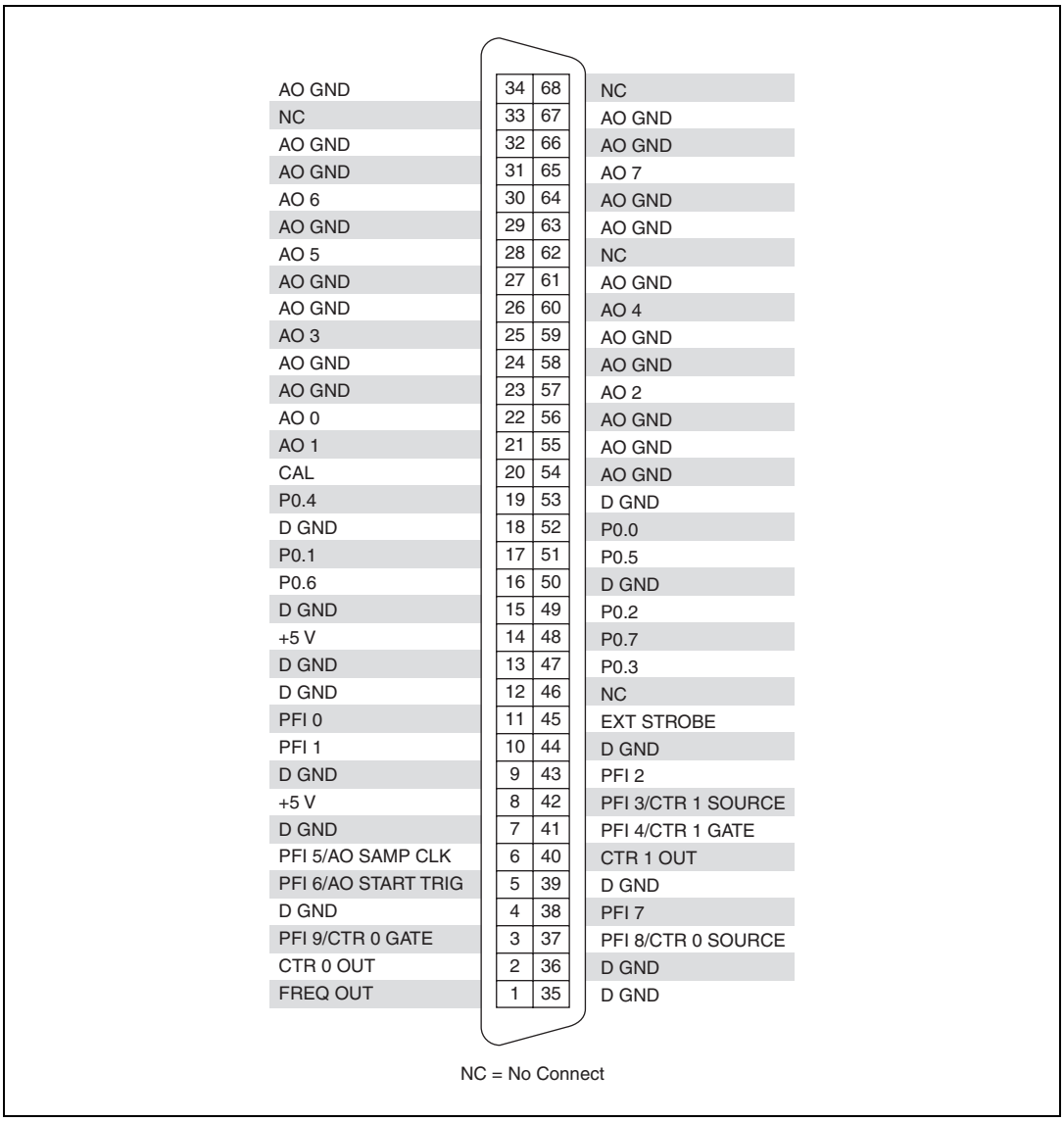
AO GND 34 68 NC
NC 33 67 AO GND
AO GND 32 66 AO GND
AO GND 31 65 AO 7
AO 6 30 64 AO GND
AO GND 29 63 AO GND
AO 5 28 62 NC
AO GND 27 61 AO GND
AO GND 26 60 AO 4
AO 3 25 59 AO GND
AO GND 24 58 AO GND
AO GND 23 57 AO 2
AO 0 22 56 AO GND
AO 1 21 55 AO GND
CAL 20 54 AO GND
P0.4 19 53 D GND
D GND 18 52 P0.0
P0.1 17 51 P0.5
P0.6 16 50 D GND
D GND 15 49 P0.2
+5 V 14 48 P0.7
D GND 13 47 P0.3
D GND 12 46 NC
PFI 0 11 45 EXT STROBE
PFI 1 10 44 D GND
D GND 9 43 PFI 2
+5 V 8 42 PFI 3/CTR 1 SOURCE
D GND 7 41 PFI 4/CTR 1 GATE
PFI 5/AO SAMP CLK 6 40 CTR 1 OUT
PFI 6/AO START TRIG 5 39 D GND
D GND 4 38 PFI 7
PFI 9/CTR 0 GATE 3 37 PFI 8/CTR 0 SOURCE
CTR 0 OUT 2 36 D GND
FREQ OUT 1 35 D GND
NC = No Connect

Figure 1. NI 6722 68-Pin AO I/O Connector Pin Assignments

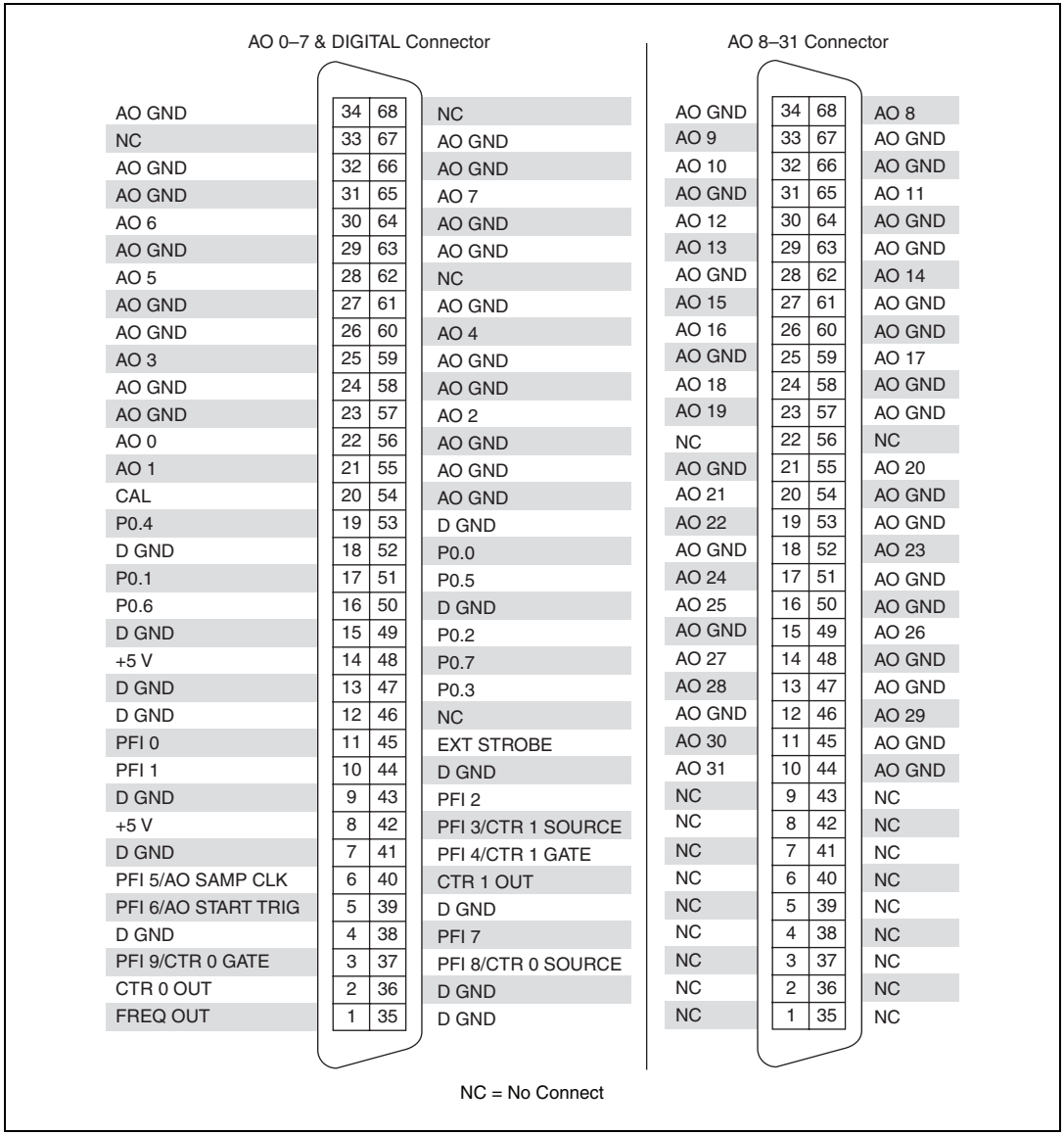
AO 0–7 & DIGITAL Connector
AO 8–31 Connector
AO GND 34 68 NC
NC 33 67 AO GND
AO GND 32 66 AO GND
AO GND 31 65 AO 7
AO 6 30 64 AO GND
AO GND 29 63 AO GND
AO 5 28 62 NC
AO GND 27 61 AO GND
AO GND 26 60 AO 4
AO 3 25 59 AO GND
AO GND 24 58 AO GND
AO GND 23 57 AO 2
AO 0 22 56 AO GND
AO 1 21 55 AO GND
CAL 20 54 AO GND
P0.4 19 53 D GND
D GND 18 52 P0.0
P0.1 17 51 P0.5
P0.6 16 50 D GND
D GND 15 49 P0.2
+5 V 14 48 P0.7
D GND 13 47 P0.3
D GND 12 46 NC
PFI 0 11 45 EXT STROBE
PFI 1 10 44 D GND
D GND 9 43 PFI 2
+5 V 8 42 PFI 3/CTR 1 SOURCE
D GND 7 41 PFI 4/CTR 1 GATE
PFI 5/AO SAMP CLK 6 40 CTR 1 OUT
PFI 6/AO START TRIG 5 39 D GND
D GND 4 38 PFI 7
PFI 9/CTR 0 GATE 3 37 PFI 8/CTR 0 SOURCE
CTR 0 OUT 2 36 D GND
FREQ OUT 1 35 D GND
AO GND 34 68 AO 8
AO 9 33 67 AO GND
AO 10 32 66 AO GND
AO GND 31 65 AO 11
AO 12 30 64 AO GND
AO 13 29 63 AO GND
AO GND 28 62 AO 14
AO 15 27 61 AO GND
AO 16 26 60 AO GND
AO GND 25 59 AO 17
AO 18 24 58 AO GND
AO 19 23 57 AO GND
NC 22 56 NC
AO GND 21 55 AO 20
AO 21 20 54 AO GND
AO 22 19 53 AO GND
AO GND 18 52 AO 23
AO 24 17 51 AO GND
AO 25 16 50 AO GND
AO GND 15 49 AO 26
AO 27 14 48 AO GND
AO 28 13 47 AO GND
AO GND 12 46 AO 29
AO 30 11 45 AO GND
AO 31 10 44 AO GND
NC 9 43 NC
NC 8 42 NC
NC 7 41 NC
NC 6 40 NC
NC 5 39 NC
NC 4 38 NC
NC 3 37 NC
NC 2 36 NC
NC 1 35 NC
NC = No Connect

Figure 2. NI 6723 68-68-Pin Extended AO I/O Connector Pin Assignments

National Instruments, NI, ni.com, and LabVIEW are trademarks of National Instruments Corporation. Refer to the *Terms of Use* section on `ni.com/legal` for more information about National Instruments trademarks. Other product and company names mentioned herein are trademarks or trade names of their respective companies. For patents covering National Instruments products, refer to the appropriate location: **Help»Patents** in your software, the `patents.txt` file on your CD, or `ni.com/patents`.

© 2003–2007 National Instruments Corporation. All rights reserved.